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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/611,448

07/01/2003

Yingjian Chen

XYNANO-1

7746

7590

12/09/2004

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EXAMINER

WEISS, HOWARD

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 12/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/611,448		CHEN ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Howard Weiss		2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 October 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 ~~is~~ are pending in the application.
- 4a) Of the above claim(s) 6-21 ~~is~~ are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 22-28 ~~is~~ are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-28 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>0703</u> . | 6) <input type="checkbox"/> Other: _____  |

Attorney's Docket Number: XYNANO-1

Filing Date: 7/1/03

Continuing Data: none

Claimed Foreign Priority Date: none

Applicant(s): Chen et al. (Dang)

Examiner: Howard Weiss

***Election/Restrictions***

1. Applicant's election without traverse of the Group I invention, Claims 1 to 5 and 22 to 28, in the reply filed on 10/3/04 is acknowledged.
2. Claims 6 to 21 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant is requested to cancel the non-elected claims as part of a complete response to this office action. Cancellation of the non-elected claims would not preclude the later filing of a divisional application on the non-elected invention (please see 35 USC 120 and 121).

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:  

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 23, 25, 27 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims state, in part, that the devices are "fabricated by at least one of the methods of Claim 6 through Claim 21, inclusive." This dependency upon multiple sets of claims encompassing different limitations is improper. The specific limitations and features being claimed should be explicitly stated in the claims in unambiguous language.

***Specification***

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 22, 24 and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Shin et al. (U.S. Patent No. 6,515,339).

Shin et al. show all aspects of the instant invention (e.g. Figures 6 to 25) including:

- a source **210**, a drain **220**, a gate **230** and a channel **260** including a nanotube of submicron diameter (e.g. Figures 20 and 21 and Column 6 lines 50 to 61 and Column 10 Lines 7 to 12)
- a plurality of electrodes connected to electronic devices and a plurality of conductive interconnects using nanotubes connecting the electrode and devices (e.g. Figures 15 to 17)

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Initially, and with respect to Claims 5, 23, 25, 27 and 28, note that a "product by process" claim is directed to the product per se, no matter how actually made. See *In re Thorpe et al.*, 227 USPQ 964 (CAFC, 1985) and the related case law cited therein which make it clear that it is the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that, as here, an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. As stated in Thorpe,

even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972); *In re Pilkington*, 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969); *Buono v. Yankee Maid Dress Corp.*, 77 F.2d 274, 279, 26 USPQ 57, 61 (2d. Cir. 1935).

Note that Applicant has burden of proof in such cases as the above case law makes clear.

10. Claims 1 to 5, 23, 25 and 27 are rejected under 35 U.S.C. § 103(a) as obvious over Shin et al. and Zhang et al. (U.S. Patent No. 6,764,874).

Shin et al. show most aspects of the instant invention (Paragraph 7) except for the magnetic nanoparticles attached to the nanotube and not encircled by the nanotube

wall and made of Co, Ni or Fe. Zhang et al. teach (e.g. Figure 9) to attach Ni, Co or FE magnetic nanoparticles **53** to nanotubes **58** to form nanotubes at lower temperatures and precise alignment (Column 8 Lines 15 to 30). It would have been obvious to a person of ordinary skill in the art at the time of invention to attach Ni, Co or FE magnetic nanoparticles to nanotubes as taught by Zhang et al. in the device of Shin et al. to form nanotubes at lower temperatures and precise alignment.

As to the grounds of rejection under "product by process", how the nanoparticles are attached to the nanotubes or how said nanotubes are fabricated pertain to process limitations which do not affect the final device structure. See MPEP § 2113 which discusses the handling of "product by process" claims.

11. Claim 28 is rejected under 35 U.S.C. § 103(a) as obvious over Shin et al. and Honlein et al. (U.S. Patent No. 6,809,361).

Shin et al. show most aspects of the instant invention (Paragraph 7) except for the electronic device including an MRAM cell. Honlein et al. teach (e.g. Figure 2) to use nanotubes **203** in an MRAM cell **200** to provide a memory unit with shortened access time, high retention time and high integration density (Column 5 Lines 14 to 17). It would have been obvious to a person of ordinary skill in the art at the time of invention to use nanotubes in an MRAM cell as taught by Honlein et al. in the device of Shin et al. to provide a memory unit with shortened access time, high retention time and high integration density.

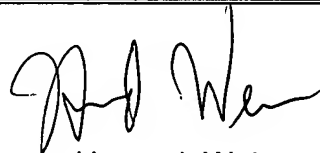
As to the grounds of rejection under "product by process", how said nanotubes are fabricated pertains to process limitation which do not affect the final device structure. See MPEP § 2113 which discusses the handling of "product by process" claims.

### ***Conclusion***

12. Paper copies of cited U.S. patents and U.S. patent application publications will cease to be mailed to applicants with Office actions as of June 2004. Paper copies of foreign patents and non-patent literature will continue to be included with office actions. These cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site ([www.uspto.gov](http://www.uspto.gov)), from the Office of Public Records and from commercial sources. Applicants are referred to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197 for information on this policy. Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.
13. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 872-9306**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.
14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(571) 272-1720** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via **Howard.Weiss@uspto.gov**.

15. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/368	12/7/04
Other Documentation: PLUS Analysis Report	11/29/04
Electronic Database(s): EAST	12/7/04



Howard Weiss  
Primary Examiner  
Art Unit 2814

HW/hw  
8 December 2004